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DEFENSE INTELLIGENCE AGENCY  
WASHINGTON, D.C. 20301

MCGWG-D-19

31 March 1970

SUBJECT: Operating Doppler Beacon on KH-4 Missions

TO: COMIREX MC&amp;G Working Group Members

Attachment, subject as above, resulting from MCGWG meeting of 31 March 1970 is forwarded for your information and advising your COMIREX member.

1 Enclosure a/s

Chairman  
COMIREX MC&G Working Group

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DEFENSE INTELLIGENCE AGENCY  
WASHINGTON, D.C. 20301

31 March 1970

MEMORANDUM FOR CHAIRMAN, COMIREX

SUBJECT: Operating Doppler Beacon on KH-4 Missions

1. Discussion at the 19 March COMIREX meeting raised concern as to the advisability of operating the Doppler Beacon of KH-4 Mission 1109 over Sino Soviet territory. This resulted in the SOC withholding operation of the Doppler Beacon over Sino Soviet territory for the balance of the mission. The purpose of this memo is to present considerations and recommendations for reinstating the operation of the Doppler Beacon over the Sino Soviet area for subsequent missions.
2. For Mission 1109 the NRO operated the Doppler Beacon over the Southern Hemisphere continuously, and in the Northern Hemisphere only where the beacon was  $2^{\circ}$  above the horizon for the receiving stations. Because of the Northern Hemisphere station locations, the Doppler Beacon was transmitting over the Sino Soviet Area in the proximity of six stations. The only reason that the NRO did not plan to operate the beacon continuously over the Northern Hemisphere was because of possible interference with another payload. Although the experiment was subsequently removed, the NRO had already completed the program. The beacon transmits on frequencies of 162 MH and 324 MH which are the standard geodetic frequencies.
3. The following considerations pertain to operating the Doppler Beacon over the Sino Soviet Area:
  - a. In planning for adding the Doppler Beacons to the KH-4 missions an UNCLASSIFIED cover story was developed and made available to foreign countries and uncleared US personnel. In contrast to the high altitude of previous Doppler Beacon programs the explanation given for change in altitude (to conform to the KH-4 orbit) has been related to atmospheric density studies and gravity model analysis at low altitudes. Because this explanation has in fact been given to each of the countries, the operation of the Doppler Beacon on these satellites is generally well-known. Further, for these reasons it would be normal for the Doppler Beacon to operate continuously.
  - b. Doppler Beacons transmitting on frequencies of 162 and 324 MH have been operated in higher altitudes continuously since 1960. Some of the satellites used for geodetic purposes which operated continuously over Sino Soviet Area include the following:

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TRANSIT 1B

" 2A

" 3B

" 4A

" 4B

ANNA 1B

Beacon Explorer B

Beacon Explorer C

GEOS I

GEOS II

The purpose of these satellites was primarily for gravity model improvements and to demonstrate the doppler navigational and geodetic technique. The beacons were tracked from a doppler complex similar to that which is now being used for tracking of the beacon on the KH-4 system. Knowledge of these programs has been UNCLASSIFIED.

c. During the 1960-1961 time period low altitude satellites operating as intelligence collection vehicles, carried Doppler Beacons. At least 3 of these missions provided Doppler data and each transmitted continuously over the Sino Soviet Bloc Area. The specific missions have been identified as follows:

Apr 60	9008
Nov 60	9012
Dec 60	9013
Feb 61	9014A

d. The Soviet ELINT collection capability scattered throughout the world can surely be expected to associate the Doppler Beacon with the KH-4 system regardless of whether the beacon is on or off over the Sino Soviet Area. Accordingly the Russians can conclude the Doppler Beacon is operating with the KH-4 camera system for positioning purposes. Therefore, no security benefits are apparent from denying the operation of the beacon over the Sino Soviet Area.

e. If we did not operate the beacon over the bloc area a major part of the tracking data from 6 stations would be lost. Degradation for the area covered by the Afghanistan station as an example would degrade from 30 meters to about 250 meters and would not meet the accuracy requirements for category I targets. In this regard, it would virtually be impossible to relocate these stations and meet requirements.

f. A self imposed restriction concerning the operation of Doppler Beacon over Sino Soviet territory could result in an undesirable precedent affecting future systems.

4. Based on an assessment of the various factors relating to the operation of the Doppler Beacon the MCG Working Group has reached the following conclusions:

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- a. Operation of the Beacon over at least a portion of the Sino Soviet Area is required for meeting accuracy requirements.
  - b. The Soviets can associate the Doppler Beacon with the KH-4 whether the system is off or on over the Sino Soviet Area.
  - c. Operation of the Beacon continuously would cause less suspicion in view of past procedures and the UNCLASSIFIED purpose given for the low altitude beacons.
  - d. Denying operation of the Doppler Beacon over the Sino Soviet could be an undesirable precedent.
5. It is recommended that guidance be provided the SOC to operate the Doppler Beacon regardless of national boundaries.

Chairman  
COMIREX MC&G Working Group

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Dr. G. H.  
File: MCG

MEMORANDUM FOR THE DIRECTOR, NATIONAL RECONNAISSANCE OFFICE STAFF

SUBJECT: MC&G Requirements for 12" SI Coverage Inside the Sino Soviet Area

1. Reference discussion in the COMIREX MCGWG on 30 January 1970 at which time your representative requested an updated indication of the MC&G coverage requirements for the 12" SI camera within the Sino Soviet area. During the discussion it was recognized that USIB-D-46.4/18 of 1 August 1968 only expressed coverage requirements outside the Sino Soviet area.
2. The DoD has informed me that the present estimate for the 12" SI collection requirement within the Sino Soviet area is 50-60% of the area over the three year period following the 1st 12" SI mission.
3. The DoD has scheduled for completion in approximately two months a more detailed and updated analysis of these requirements within the Sino Soviet area. However, no major change from the 50-60% estimate cited above is anticipated.
4. Pending further review of this coverage requirement it is recommended that your present planning recognize the estimate indicated above.

cc: Ch/COMIREX

Chairman  
COMIREX MC&G Working Group

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